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SOCIETIES AND ACADEMIES

THE HELMINTHOLOGICAL SOCIETY OF WASHINGTON

THE fifth regular meeting of the society was held in the rooms of the zoological division of the Public Health and Marine Hospital Service on March 14, 1911, Dr. Stiles acting as host and Dr. Ransom as chairman. The following foreign corresponding members were elected: Raphael Blanchard, Max Braun, Otto Fuhrmann, I. Ijima, L. A. Jägerskiöld, S. J. Johnston, Robert T. Leiper, Otto von Linstow, Arthur Looss, Max Luehe, Sir Patrick Manson, Francesco Monticelli, L. G. Neumann, George H. F. Nuttall, Corrado Parona, Edoardo Perroncito, Theodor Pintner, Alcide Railliet, Arthur E. Shipley and Fritz Zschokke.

Dr. Garrison gave a summary of a report by Surgeon C. S. Butler, U. S. Navy, and himself upon the parasites found at autopsy upon dogs, cats and rats at the U. S. Medical School during the past year. Twelve dogs, ten cats and ten rats (*Mus decumanus*) were examined with the following results:

Dogs—*Filaria* (species undetermined), two infections; *Ascaris canis*, five infections; *Trichuris depressiusculus*, one infection; *Ancylostoma caninum*, five infections; *Tænia pisiformis*, three infections; *Dipylidium caninum*, six infections.

Cats—*Ascaris canis*, eight infections; *Tænia teniaeformis*, two infections; *Dipylidium caninum*, six infections.

Rats—*Trypanosoma lewisi*, one infection; *Trichinella spiralis*, one infection; *Trichosoma hepaticum*, four infections; *Trichosoma crassicauda*, seven infections (two bladders not examined); *Heterakis spumosa*, eight infections; *Hymenolepis nana*, one infection (in white rat); *H. diminuta*, five infections; *Cysticercus fasciolaris*, eight infections.

In addition, the examination of about twenty cock-roaches showed infections with *Amæba blattæ* and numerous ciliates and flagellates. No gregarines were found.

Dr. Stiles called attention to the desirability of using fresh material for parasite study in class work.

The secretary read a short note by Mr. Crawley on *Trypanosoma americanum*. This parasite has been found in dried smears of centrifuged bovine blood. This is of interest, since the trypanosome has hitherto been found only in bouillon cultures of the blood. The morphology of the organism as found in the fresh blood is the same as that of specimens appearing in culture tubes.

Mr. Hall presented a paper entitled "The Limitations of Fecal Examination as a Means of Determining Existing Parasitism of the Digestive Tract." Certain writers have claimed a relation between the number of parasites present in any host and the number of eggs in a given amount of fæces from that host. This does not appear to be a general truth with wide application. Besides the element of chance in the detection of eggs, there are certain conditions which permit of parasitism of the digestive tract without eggs in the feces to indicate it. Some of these conditions are: (1) Infections with nematodes, usually light, where only males are present; (2) recent infections, at times heavy, in which the infecting larvæ of any species have not yet reached the egg-producing stage; (3) interruption of egg-production, as by breaking of strobila in tapeworms, or cessation of egg-production, as in the case of barren nematodes; (4) irregularity of passage of eggs from the host, due to purging, passage of mucus, diarrhœa, use of thymol or alcohol, etc. Consecutive and careful examinations of the fæces of a given animal show days when eggs of various kinds are abundant and days when they are scarce or missing. This would be particularly true of cestodes. Negative examinations must be considered doubtful and must be checked at intervals if infection is suspected.

Dr. Stiles presented a paper entitled "A Comparison of New England and Southern Mills with Reference to Natural Advantages and the Presence of Parasitic Diseases."

THE sixth regular meeting of the society was held in the rooms of the zoological division of the Public Health and Marine Hospital Service on April 11, 1911, Dr. Stiles acting as host and Dr. Garrison as chairman.

The following American corresponding members were elected: F. D. Barker, Cooper Curtice, C. A. Kofoid, E. Linton, W. S. Nickerson, H. S. Pratt, Allen J. Smith, L. D. Swingle, A. E. Verrill, H. B. Ward, Creighton Wellman, D. G. Willets and R. T. Young.

Dr. Stiles presented a note on a case of poisoning by the Portuguese man-of-war. The poisoning had been attributed to the fish which commonly accompanies this cœlenterate. This was an error, as the stings were due to the jellyfish itself. These stings were very painful and persisted for some time in spite of treatment. The subject of poisoning by jellyfish is one that has not received adequate study.

Dr. Stiles presented a second note on the findings in fecal examination of 82 southern school children aged six to twelve years. Infection with hookworm was found in 5 per cent., with *Ascaris* in 41 per cent., with *Trichuris* in 15 per cent. and with *Hymenolepis nana* in 6 per cent.

Dr. Ransom presented a paper entitled "A New Cestode from an African Bustard" in which was described a new species and genus, belonging to the family Davaineidae. The specimens on which the description is based were collected by Mr. Loring, of the Roosevelt African Expedition, in British East Africa, from the intestine of a bustard, *Neotis caffra*. The worms are characterized particularly by the presence of ten to twelve rows of very numerous hammer-shaped hooks on the rostellum. Parauterine organs are present in gravid segments. The complete paper will appear in a forthcoming publication of the Smithsonian Institution.

Mr. Hall presented the following notes:

The Coyote as a Host of Multiceps multiceps.

Curtice in 1890 first suggested that the adult gid tapeworm might occur in the coyote. In 1910 Hall noted the likelihood of this being true and pointed out that if it were true, then the most essential step in the prophylaxis of gid was the destruction of the heads of sheep dying of this disease, since the other prophylactic measure which is commonly advocated, the administration of tapeworm medicines to dogs, is obviously inadequate if coyotes also carry the parasite. In another article in the same year Hall noted that we had absolutely no evidence as to whether the coyote carried the adult worm, and that the only known host is the dog. The data regarding the blue fox and red fox as hosts of the gid tapeworm are quite inadequate and these animals must be considered doubtful hosts on the evidence at hand. There is no record of any sort as regards the wolves, martin or polecat, all of which have been noted as possible hosts.

To settle the question as to whether the coyote carried the adult gid tapeworm, a matter of considerable interest in that the coyote is the most common of the wild carnivora which prey upon western sheep, the experiment was tried of feeding the larval *Multiceps multiceps*, recovered by operation from the brain of a giddy sheep, to two coyotes. The sheep was operated on April 4, 1911, and the cœnurus was fed to the coyotes shortly after the operation, each animal receiving about half of the cyst. One coyote was found

dead the morning of April 10. Post-mortem examination showed death to be due to septicæmia. The entire length of the small intestine showed severe ecchymotic hemorrhage. Fifty-two heads of *M. multiceps* were recovered from the intestinal contents. A comparison of these worms after six days' development with some recovered from a dog after ten days' development shows the worms had established themselves and were developing normally. They were still very small, of course, but there is no reason to suppose that they would not have developed to maturity if the coyote had lived.

The coyotes, *Canis nebracensis*, according to Dr. Bailey, of the Biological Survey, were obtained in northern Montana in the area where gid is enzootic and the coyote, therefore, must be considered, in view of the experimental findings, as sharing with the dog the responsibility for carrying the gid parasite and maintaining the gid disease in that state.

A Third Case of Multiceps serialis in the Squirrel.

In a list of occurrences claimed for the larval *Multiceps serialis*, Hall in 1910 noted that Cobbold in 1864 had recorded *M. serialis* under the name by which it is more commonly known, *Cœnurus serialis*, from an American squirrel in England, the host being specified in a later article by Cobbold in 1879 as probably *Sciurus vulpinus*, and that Cagny in 1882 had recorded a second case from the squirrel, *Sciurus vulgaris*, in France. Hall accepted these records as probably correct. It was a fair assumption that Cobbold's cœnurus would be the same species as that found in another rodent, the rabbit, rather than the species found in the sheep. He did not specify whether the American squirrel was merely an American species or the animal in question was actually from America. If it was infected in America at that date, it would be much more likely that the parasite was *M. serialis* than *M. multiceps*, as the latter form is much the more rare and limited in distribution now and probably was even more so then. Kunsemüller, in an article in 1903, thinks this cœnurus of Cobbold's was probably *M. serialis*. Cagny found his cœnurus in a squirrel which had been caught young and kept three years. His specimen was examined by Mégnin and Railliet, both of whom pronounced it *Cœnurus serialis*.

In the article already noted, Hall stated that it was to be expected that a parasite like *M. serialis*

would be rare in a host like the squirrel, as the squirrel's food is of such a nature, consisting as it does largely of nuts, that faecal contamination by carnivorous hosts of the adult worm would only occur very rarely.

Recently the writer has produced the larval *M. serialis* in an American squirrel, *Sciurus carolinensis*, by feeding proglottids of the adult worm from the dog. This proof that the squirrel may act as host of *M. serialis* warrants us in accepting Cobbold's and Cagny's cases without reservation.

The squirrel was fed December 29, 1910, with fifteen proglottids collected eight days before from the faeces of a dog infected with the adult *M. serialis* by feeding the larval form from the rabbit. The proglottids had been kept in water from the time they were collected. Superficial examination indicated that some of the proglottids were gravid and some were not. As the proglottids were injected into the mouth the squirrel stored part of them in the cheek pouches, but it was certain that the rotten proglottids would release some of the eggs and that these would be swallowed even though the proglottids might be rejected later. Ninety-two days after ingesting the proglottids, the squirrel died. It had been active up to two or three days before death and had then remained down, clawing at its jaws occasionally. Before the skin was removed, the swellings on the abdomen, back and legs plainly showed the presence of the parasite cysts. After skinning the animal, the cysts were found on the lower abdomen, the middle of the back, the right shoulder and side, the right hind quarter, the left thigh, the left hind quarter, the left calf and the left breast, side and shoulder. An incision along the abdomen did not disclose any on the viscera. The thorax was not opened, and the specimen was preserved intact except for two cysts which fell out from a superficial position under the skin on the abdomen. One of these was cut in two and both cysts were put in the ice-box at a temperature of 12 to 14° C. for 44 hours. At the end of that time they were immersed in warm water. The one which had been cut in two showed no sign of movement and was apparently dead. The other cyst, which had been punctured and lost a large part of the contained fluid, showed the contractile movements characteristic of bladder-worms and was cut in two and fed to two dogs.

The cysts showed the linear arrangement of scolices which is often found in *M. serialis* and from which the species takes its name. The identification of the parasite in this case is based less

on this, however, than on the fact that it was produced by feeding the adult worm.

The secretary read a paper by Mr. Foster entitled "Some Experiments in the Development of *Tenia teniaeformis* (Bloch, 1780) Stiles and Stevenson, 1905; with an Account of Coccidiosis in the Cat." By feeding experiments the larval parasite was developed in the rat from the cat tapeworm and the cat tapeworm developed in turn from these larvæ. Attempts to infect dogs failed. Some differences were found in the larval and adult hooks. In general the results agreed with those of earlier experiments. A coccidium found in the cat proved to be much larger than *Coccidium bigeminum*, the only form hitherto reported from the cat. It resembled *Eimeria stiedæ* in size but differed from it in the piriform shape of the oocyst and the absence of residual protoplasm.

Dr. Garrison gave a demonstration of a new intestine tray for autopsies. This consists of a copper sheet 30 inches long, 10 inches wide at the broad end and 5 inches wide at the narrow end, with a raised edge an inch and a half high, and with a steel rod attached to the raised edge where it is prolonged along the broad end and running above the tray to the narrow end where the rod rests on the body of the tray, the end of the rod curving downward over the narrow end of the tray. At the ends the tray is bent down to form vertical supports 6 inches long at the wide end and 4 inches at the narrow end. The floor of the tray is convex upward, the middle being about an inch higher than the sides. In use the tray is placed over two pails or jars with a slight slope downward toward the narrow end, or else the tray is stood up in two shallow dishes, the slope being obtained by virtue of the greater length of the vertical support at the broad end.

The intestines are placed in the jar or other receptacle at the lower narrow end of the tray and one end of the intestine is pulled up on the steel rod. The section of intestine held by the rod is then cut open and falls on the floor of the tray where it can be examined and washed, the contents going into the lower jar. When one section of intestine is examined it is placed in the upper jar at the same time that a fresh section is pulled on to the rod. The size of the rods varies with the size of the animals examined. To facilitate detection of parasites the tray should be painted or enameled black. The tray can be easily cleaned and sterilized.

MAURICE C. HALL,
Secretary